



مدينة الملك سعود الطبية
KING SAUD MEDICAL CITY

Development in Infants and Children

Division of Child Development, KSMC

AYMAN ALHAZMI

Development

- ▶ Development refers to a progressive increase in skill and capacity of function
- ▶ It is a qualitative change in the child's functioning
- It can be measured through observation.

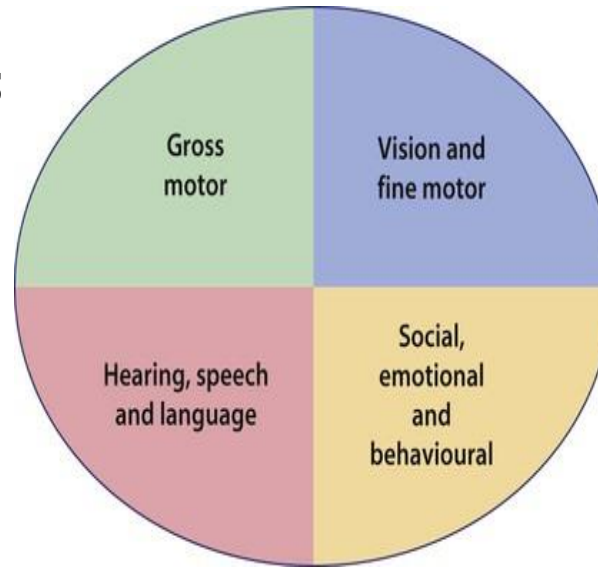


Normal Development

Development occurs with sequential acquisition

of skills in four different areas

- Gross Motor
- Fine Motor
- Language
- Psychosocial



Language development approximates cognition

Normal Development Principles

- ▶ Development is a continuous process
- ▶ The sequence is the same but the rate varies between children
- ▶ Development proceeds from the simple to the complex and from the general to the specific
- ▶ Development is related to the rate of maturation of the CNS
- ▶ **No strict** line between normal and abnormal

Principles Continued

- ▶ Development process influences by a multiple factors.
- ▶ Each stage of development is affected by the preceding stage

Importance of developmental assessment

- ▶ **Early detection** of deviation in child's pattern of development
- ▶ Simple and time efficient mechanism to ensure adequate surveillance of developmental progress
- ▶ Early detection may reduce or prevent long term disability i.e. **early intervention**
- ▶ Most efficient screening is in the context of a continuous relationship with the family

Hypotonia
(decreased
muscle tone)



ADAM.



Tonic
neck
reflex



Grasp
reflex



Step
reflex



Crawl
reflex



ADAM.

Importance of development for Health professionals

- ▶ Knowing what to expect of a particular child at any given age.
- ▶ Helping in parents' education in order to achieve optimal growth & development at each stage
- ▶ Importance of Surveillance and screening
- ▶ Helping in formulating the plan of care

Gross Motor Development

Gross motor developmental milestone

Age	Milestone
3 months	Neck Holding
5 months	Rolls over
6 months	Sits in tripod fashion
8 months	Sitting without support
9 months	Stands with support
12 Months	Creeps well; walks but falls; stands without support
15 months	Walks alone; creeps upstairs
18 months	Runs; explores drawers
2 years	Walks up and downstairs; jumps
3 years	Rides tricycle; alternate feet going upstairs
4 years	Hops on one foot; alternate feet going downstairs



Gross motor development (median ages)

newborn



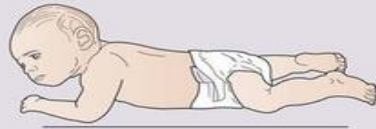
Limbs flexed, symmetrical posture

newborn



Marked head lag on pulling up

6–8 weeks



Raises head to 45° in prone

6–8 months



Sits without support
– at 6 months: with round back
– at 8 months: with straight back (shown)

8–9 months



Crawling

10 months



Cruises around furniture

12 months



Walks unsteadily,
broad gait, hands apart

15 months



Walks steadily

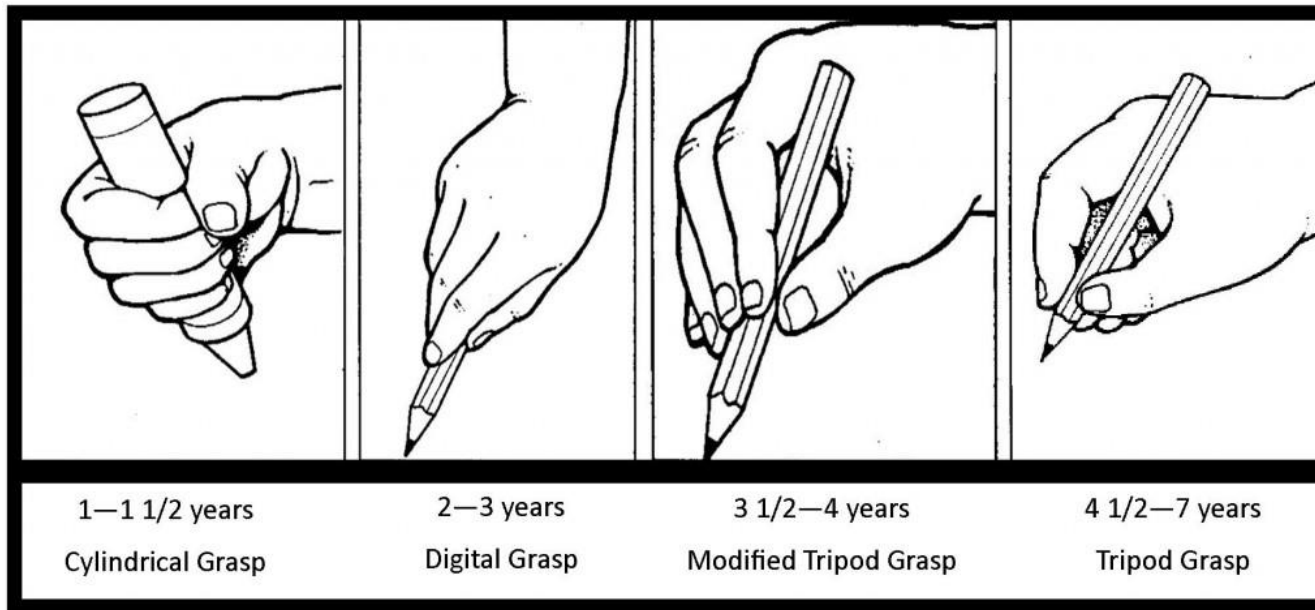
Fine motor

Fine motor developmental milestones








Age	Milestone
4 months	Bidextrous reach
6 months	Unidextrous reach; transfer object
9 months	Immature pincer grasp; probes with forefinger
12 months	Pincer grasp mature
15 months	Imitates scribbling; tower of 2 blocks
18 months	Scribbles; tower of 3 blocks
2 years	Tower of 6 blocks; vertical and circular stroke
3 years	Tower of 9 blocks; copies circle
4 years	Copies cross; bridge with blocks
5 years	Copies triangle



Fine motor



Fine motor

Age	Block test	Pencil test
3–3½ years	Build a bridge 	Draw a circle 
3½–4 years		Draw a cross 
3–4½ years	Build a gate 	Draw a square 
5–6 years	Build steps 	Draw a triangle 

Language

language milestones

Age	Milestone
1 months	Alerts to sound
3 months	Coos
4 months	Laugh loud
6 months	Monosyllables
9 months	Bisyllables
12 months	1-2 words with meaning
18 months	8-10 words vocabulary
2 years	2-3 words sentence, use pronouns "I", "me", "you"
3 years	Ask questions; knows full name and gender
4 years	Says song or poem; tells stories
5 years	Asks meaning of words











Personal/social

Key social and adaptive milestones

Age	Milestone
2m	Social smile
3m	Recognizes mother
6m	Recognizes strangers, stranger anxiety
9m	Waves “bye bye”
12m	Comes when called, plays simple ball game
15m	Jargon
18m	Copies parents in tasks
2yr	Asks for food, drink, toilet
3yr	Shares toys, knows full name and gender
4yr	Plays cooperatively in a group, goes to toilet alone.
5yr	Helps in household tasks, dressing and undressing

Personal/social

Social, emotional and behavioural development (median ages)

- (a) **6 WEEKS**

Smiles responsively
- (b) **6-8 MONTHS**

Puts food in mouth
- (c) **10-12 MONTHS**

Waves bye-bye, plays peek-a-boo
- (d) **12 MONTHS**

Drinks from a cup with two hands
- (e) **18 MONTHS**

Holds spoon and gets food safely to mouth
- (f) **18-24 MONTHS**

Symbolic play
- (g) **2 YEARS**

Dry by day. Pulls off some clothing
- (h) **2.5-3 YEARS**

Parallel play. Interactive play evolving. Takes turn

Developmental Warning Signs

Red Flag

Age	Missed Milestones Requiring Intervention
2 mo	Lack of visual fixation No social smile
4–6 mo	Fails to track person or object No steady head control No response/turn to sound or voice
6 mo	Decrease/absence of vocalizations
9–12 mo	Fails to sit independently
18 mo	Fails to walk independently Does not seek shared attention to object/event with caregiver
24 mo	No single words
36 mo	No three word sentences Cannot follow simple commands
>3 y	Speech unintelligible Dependence on gestures to follow commands

Developmental Warning Signs

- ▶ **0-1 Year**

- ▶ **GM:**

- ▶ Persisting primitive reflexes
- ▶ No head control
- ▶ Not sitting by 9 months

- ▶ **FM:**

- ▶ Fisting
- ▶ Unable to grasp object by 9 months
- ▶ Hand preference before 12 months
- ▶ Head circumference < 3P or > 97P

- ▶ No visual fixation

- ▶ Squint

- ▶ **Comm:**

- ▶ No response to sound
- ▶ No vocalizing by 6 months

Developmental Warning Signs

- ▶ 1-2 years
- ▶ Not walking by 18 months
- ▶ No pincer grasp
- ▶ Unable to understand simple commands by 18-24 months
- ▶ No word by 18 months

Developmental Delay

► Definition:

Failure to attain the appropriate developmental milestones for child's corrected age

Corrected age:

At birth: Term – gestational age in wks

Until 2 years: Chronological age – wks or months

Global Developmental Delay GDD

- ▶ Significant delay in 2/> developmental domains i.e Gross/fine motor, speech/language, cognition, social/personal, activities of daily living.
- ▶ Often refers to the younger child < 5 years.
- ▶ Delay vs deviation

Intellectual Disability

- ▶ This is a disorder with onset during the developmental period that includes **both intellectual and adaptive functioning deficits** in conceptual, social, and practical domains

Approach to the child with delay

- ▶ History: *detailed*
- ▶ Examination
- ▶ Management

Approach continued

1. Establish the existence of a delay
2. Search for a possible underlying responsible etiology: basic/ special investigations
3. Referral to appropriate rehabilitation services
4. Refer for specialist/ subspecialist
5. Inform and counsel family
6. Manage associated medical/behavioral conditions

Referrals

- ▶ Know guidelines for referral
- ▶ Specialist Neurodevelopmental Service/
Paed Neurology
- ▶ Other professions: Physio, Speech therapy,
OT

Take home message

- ▶ Identify children at risk from birth and PMH
- ▶ Use a tool: checklist
- ▶ Know referral pathways and refer appropriately
- ▶ Believe parents
- ▶ Developmental screening and surveillance is best done in context of medical home
- ▶ Never do a developmental assessment on a sick child
- ▶ Early detection means early intervention

Thank you!

